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<p>(21) International Application Number: PCT/DK93/00296 (22) International Filing Date: 15 September 1993 (15.09.93) (30) Priority data: 1135/92 15 September 1992 (15.09.92) DK (71)(72) Applicant and Inventor: BENTZON, Frank [DK/DK]; C.A. Thyregodsvej 105, DK-8230 Åbyhøj (DK). (74) Agent: K. SKØTT-JENSEN PATENTINGENIØRER A/ S; Lemmingvej 225, DK-8361 Hasselager (DK). (81) Designated States: DE (Utility model), DK (Utility model), NO, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p>		<p>Published <i>With international search report.</i> <i>In English translation (filed in Danish).</i></p>

In floorings with coupled plastic tiles (2) of e.g. 25x25 cm, it is known that for various markings in a flooring of a first colour, it is possible to make use of smaller and differently coloured modular tiles (4), e.g. of 5x5 cm, corresponding to the modular arrangement of the coupling means. It is not possible, then, to make the side length of the small tiles still shorter, but according to the invention it is, nevertheless, possible to achieve a higher degree of resolution of the markings, viz. in using the particular side length at only one, two or three sides of tiles of a reduced area (8, 12), when the system also comprises corresponding complementary tiles (10, 14) of the first colour. Already with a diagonal separation of the tiles (8, 10) widely improved possibilities for the differentiation of e.g. a type face will be obtained.

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A FLOORING SYSTEM WITH JOINABLE TILES, PRIMARILY PLASTIC TILES

The present invention relates to a system of flooring tiles of the type, by which the single tiles are adapted to be coupled edge to edge by means of interengaging coupling means, e.g. as disclosed in WO92/20885. A practical tile size will be 25 x 25 cm, but in the said WO publication it is specified that it will be possible to work with modular tiles of reduced size, by way of example with the modular measure 5 cm, whereby it is possible, with differently coloured tiles, to provide for integrated writing or figure markings in an otherwise homogenous flooring or place covering. Particularly in connection with plastic tiles it is possible to produce tiles having a very high colour stability, such that the said markings may be substantially more durable than colour painting, this being noticeable particularly on outdoor areas with heavy sunlight and of course on areas, at which wear occurs.

In practice, however, there will be a lower limit for the size of the modular tiles, e.g. the said 5 x 5 cm, at least when the joining means are arranged in a corresponding modular manner. When the markings are to be made with the use of these small tiles as the basic pixels it will, after all, be limited how large the possible resolution can be in case of curved lines or finer details on a small area.

The present invention is based on the consideration that it is perfectly possible to maintain the small modular measure, i.e. side measure of the tiles, and still have the possibility of achieving an increased resolution in the markings, namely primarily just by using diagonally separated triangular tiles, whereby the tile area halved. In most cases it will not even be necessary to arrange for any coupling together along the diagonal separation line, since the two adjoining tiles will be sufficiently held together with the neighbouring tiles located at the cathedral sides of each of the

triangular tiles, while normally there will also occur couplings between the tiles all the way round of the considered spot, such that the coherence is good in all directions across the joint.

In the system according to the invention, generally, the system should comprise not only the basic, rectangular tiles, of which some are made with a deviating colour or character, but also correspondingly different tile elements with complementary, non-rectangular shapes, preferably corresponding to the rectangular tiles divided diagonally and each having coupling means at at least one of the edge faces. The separation lines between the complementary tiles may extend in any suitable manner, even curved. Here, the said basic tiles are the tiles exhibiting the same shape as the laid-together complementary tiles; they may well be small modular tiles in a system having larger main tiles.

The basic shape of the tiles will preferably be quadratic, but also oblong shapes can be used, and in principle the joined complementary tiles should not necessarily form a single main tile, when only the result is a usable modular unit, whether square or oblong.

In the following the invention is described in more detail with reference to the drawing, in which:-

Figs 1 and 2 are plan views of ornamented floorings according to the invention,

Fig. 3 is a corresponding view of the letter B, and

Fig. 4 is a plan view of complementary tiles used therein.

In Fig. 1 is shown a flooring made with a system according to the invention, comprising large tiles 2 with uniform colour and character and small modular tiles 4 and 6, of which the tiles 4 have the same character as the tiles 2, while the tiles 6 have another colour. These tiles may be designed just as described in

in the said WO92/20885. It is also shown that at normally rounded letter corners small triangular tiles 8 are used for forming an outer contour as an inclined line at 45° , and corresponding triangular tiles 10 for filling out the remaining space at the corners. For a modular size of 5 x 5 cm of the tiles 4,6, the visual improvement is still better than appearing from the figure, compared with the use of only square tiles 4,6.

Fig. 2 is just another example, showing that with the use of the triangular tiles it is possible to provide for longer extensions of the inclined lines than at the cut corners in Fig. 1, see particularly the letter X. Also the letter t shows a special use of the triangular tiles.

In Fig. 3 it is shown that for a middle incision in the rear edge of the letter B a special tile 12 is used, shown also in Fig. 4 together with its complementary tile 14. The particular shape will not need to be further described.

In Fig. 1 the pixel number 5x7 is used for the letters and modular sides 1x1 of the tiles 4,6,8 and 10. For a higher pixel number, of course, an improved stylistic effect is achievable with the use of the triangular tiles. The said modular sides should not be just 1x1; there may be many modular sizes, e.g. 2x2, 2x3, 1x4 or 3x5, as the cathetus should not necessarily be equally long. It will also be possible to let the diagonal edges extend with a broken or curved shape, when only the system also comprises the required complementary tiles with one or more other colours or characters. Hereby it will be possible to make use of e.g. soft curves on the tiles, optionally also on the tiles of the larger modular size, here 5x5 in the considered example. Even with the use of relatively few basic shapes it is then possible to obtain largely widened possibilities for the shaping of the markings.

If in a given structure there are long stretches with continuous inclined lines the integrity of the structure will be weakened, and it may be preferable, then, at least locally, to use coupling means between the tiles, e.g. of the same type as already used in the system; only the system should then comprise correspondingly designed tiles, where also the diagonal edges are provided with special coupling portions.

The tiles being highly weatherproof, the invention with all its possibilities may well be related to the build-up of outdoor signs of reasonably large sizes.

Another possibility for establishing of markings will be to use the holes or butt joints of the tiles to receive holding portions on cover plate elements of different forms, which can be combined into desired patterns, but the preferred solution will still be the one described in the foregoing, where the structure of the flooring is practically the same, irrespective of the presence of a relatively detailed marking.

For many applications it is preferred to use tiles with throughholes as shown in Fig. 7 of the said WO publication, where also a couple of small tiles is shown, these having similar holes. According to the invention and with reference to Fig.1, in such floorings it is preferred to use tiles 4,10 with holes, but tiles 6,8 without holes, as this makes the marking still clearer.

The considered small tiles are provided with a central, tubular support portion, which is marked by a dotted line in Fig. 4. It will be appreciated that also the triangular tile 14 will thus be effectively supported at its rectangular corner, while the opposed edge is supported by an edge wall.

C L A I M S :

1. A flooring system with joinable tile elements of rectangular shape, notably plastic tiles, of which some are of a deviating colour or character in order to form an integrated ornamentation of the flooring, characterized in that the system also comprises correspondingly different tile elements of complementary, non-rectangular shapes, preferably corresponding to the rectangular tiles diagonally divided, and each having joining means at at least one of the edges.

2. A system according to claim 1, characterized in that some of the complementary tiles are shaped with $1/4$ and $3/4$ of the element size, viz. in being separated from the center out to two corners at the same element side.

3. A system according to claim 1 and comprising tile elements of a large basic size and elements of smaller size that are joinable with and modularly adapted to the large tiles, e.g. having $1/5$ of the side length of the basic tiles, characterized in that the non-rectangular complementary elements are based on the modular elements of the smaller size.

4. A system according to claim 1, in which the tile elements for large, coherent floor areas are provided with holes in their top sides, characterized in that the elements forming the ornamentation are without such holes.

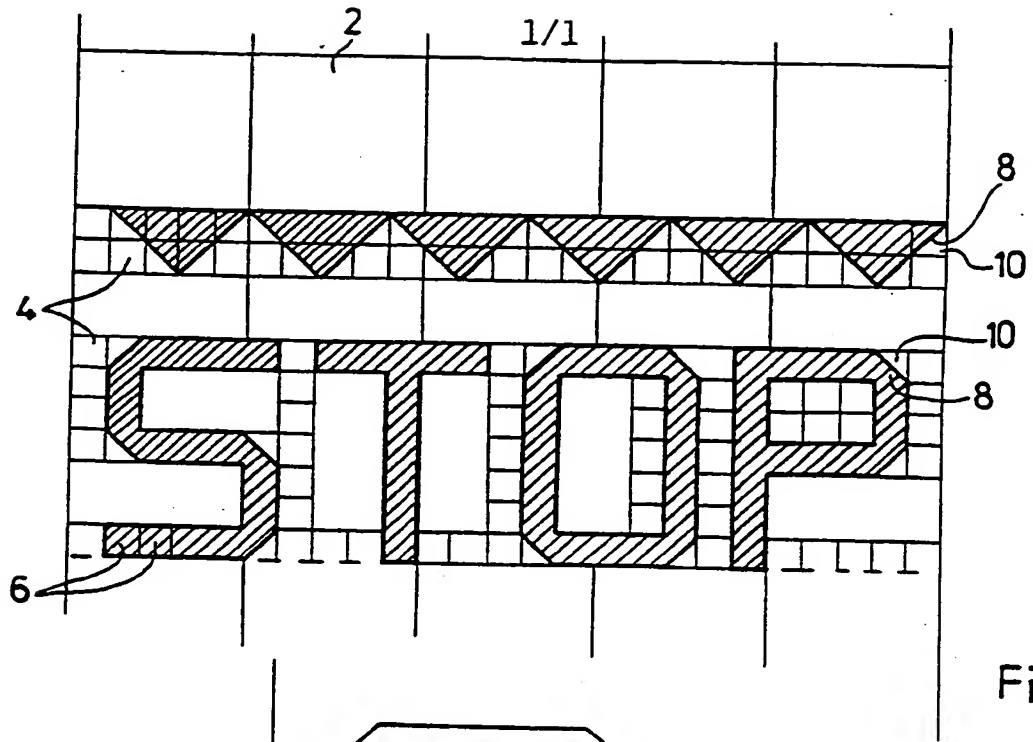


Fig. 1

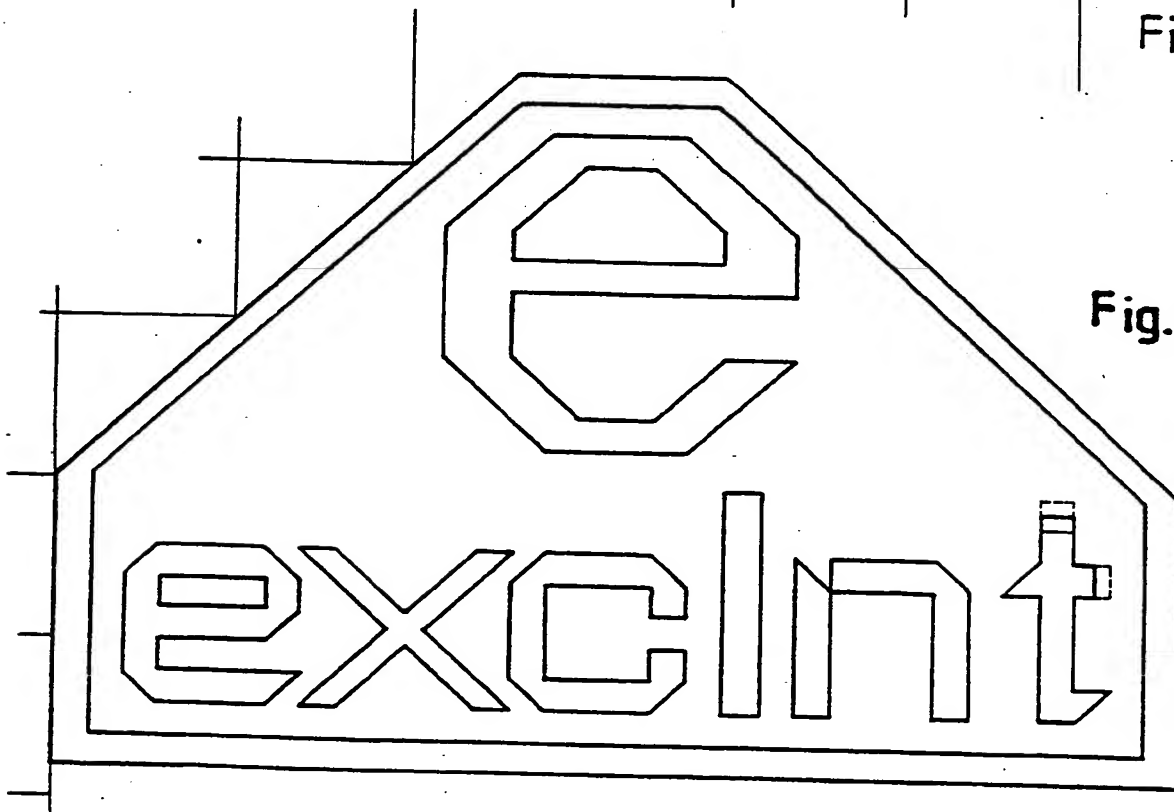


Fig. 2

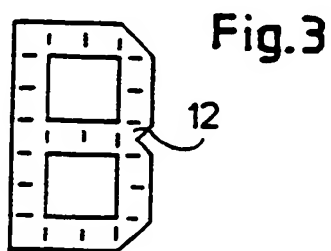


Fig. 3

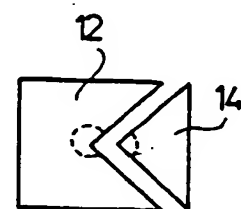


Fig. 4

SUBSTITUTE SHEET

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 93/00296

A. CLASSIFICATION OF SUBJECT MATTER

IPC5: E04F 15/10

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: B44C, E01C, E04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DIALOG, B 350, 351, 340

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CH, A, 540398 (W. FRÜH), 28 Sept 1973 (28.09.73), column 1, line 3 - line 29 --	1-4
Y	EP, A1, 0487807 (SCHEIWILLER, R. ET AL), 3 June 1992 (03.06.92), column 2, line 34 - line 49; column 3, line 16 - line 19; column 3, line 30 - line 40, figures 14-23,32, abstract --	1-4
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Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,Y	WO, A1, 9220885 (BENTZON, F.), 26 November 1992 (26.11.92), the whole document -- -----	1-4

INTERNATIONAL SEARCH REPORT

Information on patent family members

27/11/93

International application No.

PCT/DK 93/00296

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CH-A- 540398	28/09/73	NONE	
EP-A1- 0487807	03/06/92	NONE	
DE-A1- 3633941	30/04/87	DE-U- 8528306	22/05/86
WO-A1- 9220885	26/11/92	NONE	

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